

Evaporation Materials: Fluorides

Our evaporation materials are available as granules with size from 1mm, pellets with diameter from 5mm, targets with size up to 1,000mm. They are suitable for both electron- and ion-beam evaporation as well as ion beam sputtering. The parameters in the table below are approximate and depend on the sinter and application conditions.

| material | AlF_3 aluminium fluoride | BaF_2 barium fluoride | BaY_2F_8 barium yttrium fluoride | BiF_3 bismuth fluoride |
|-----------------------------------|---|---|--|--|
| density colour transmission | 2.9g/cm ³ white 150nm...10µm | 4.8g/cm ³ white 150nm...15µm | 5.0g/cm ³ white 300nm...10µm | 5.3g/cm ³ grey-white 300nm...12.5µm |

refractive index and transmission

| wavelength | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 140nm | - | - | - | - |
| 150nm | 1.42 | 1.68 | - | - |
| 190nm | 1.40 | 1.57 | - | - |
| 300nm | 1.37 | 1.50 | 1.55 | 1.90 |
| 400nm | 1.36 | 1.48 | 1.52 | 1.80 |
| 600nm | 1.35 | 1.47 | 1.51 | 1.74 |
| 800nm | 1.34 | 1.47 | 1.51 | 1.73 |
| 1µm | 1.33 | 1.47 | 1.51 | 1.72 |
| 2µm | 1.33 | 1.47 | 1.50 | 1.71 |
| 4µm | 1.32 | 1.46 | 1.50 | 1.70 |
| 7µm | 1.31 | 1.44 | 1.48 | 1.65 |
| 8µm | 1.31 | 1.43 | 1.47 | 1.62 |
| 10µm | 1.30 | 1.40 | 1.45 | 1.60 |
| 12.5µm | - | 1.36 | - | 1.54 |
| 15µm | - | 1.31 | - | - |
| standard form and size (other forms and sizes are available by request) | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 310 | 310 | 570 | 2.850 |

recommended crystalline quartz deposition monitors:
- with silver as electrode material

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| material | CeF ₃ cerium fluoride | MgF ₂ magnesium fluoride | Na ₃ AlF ₆ cryolite | PbF ₂ lead fluoride | SrF ₂ strontium fluoride |
|-----------------------------------|--|--|---|---|---|
| density colour transmission | 6.2g/cm ³ rosa-white 300nm...12.5µm | 3.2g/cm ³ white 140nm...7µm | 3.0g/cm ³ white 190nm...12.5µm | 8.2g/cm ³ white 300nm...12.5µm | 4.2g/cm ³ white 190nm...12.5µm |

refractive index and transmission

| wavelength | | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 140nm | - | 1.50 | - | - | - |
| 150nm | - | 1.48 | - | - | - |
| 190nm | - | 1.43 | 1.45 | - | 1.51 |
| 300nm | 1.75 | 1.39 | 1.37 | 1.94 | 1.46 |
| 400nm | 1.64 | 1.38 | 1.35 | 1.82 | 1.45 |
| 600nm | 1.59 | 1.38 | 1.33 | 1.76 | 1.44 |
| 800nm | 1.58 | 1.38 | 1.32 | 1.75 | 1.43 |
| 1µm | 1.57 | 1.37 | 1.32 | 1.74 | 1.43 |
| 2µm | 1.57 | 1.36 | 1.32 | 1.73 | 1.43 |
| 4µm | 1.56 | 1.35 | 1.31 | 1.72 | 1.42 |
| 7µm | 1.52 | 1.30 | 1.30 | 1.69 | 1.40 |
| 8µm | 1.50 | - | 1.29 | 1.67 | 1.38 |
| 10µm | 1.42 | - | 1.26 | 1.64 | 1.35 |
| 12.5µm | 1.38 | - | 1.22 | 1.57 | 1.29 |
| 15µm | - | - | - | - | - |
| standard form and size (other forms and sizes are available by request) | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 350 | 170 | 320 | 410 | 410 |

recommended crystalline quartz deposition monitors:
- with silver as electrode material

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| material | YF ₃ yttrium fluoride | YbF ₃ ytterbium fluoride |
|-----------------------------------|--|---|
| density colour transmission | 4.0g/cm ³ gray 190nm...12.5µm | 8.2g/cm ³ beige 190nm...12.5µm |

refractive index and transmission

| wavelength | | |
|--|---------------------------------|---------------------------------|
| 140nm | - | - |
| 150nm | - | - |
| 190nm | 1.65 | 1.64 |
| 300nm | 1.55 | 1.60 |
| 400nm | 1.49 | 1.56 |
| 600nm | 1.48 | 1.55 |
| 800nm | 1.48 | 1.55 |
| 1µm | 1.47 | 1.55 |
| 2µm | 1.46 | 1.54 |
| 4µm | 1.45 | 1.53 |
| 7µm | 1.43 | 1.49 |
| 8µm | 1.41 | 1.47 |
| 10µm | 1.32 | 1.40 |
| 12.5µm | 1.25 | 1.33 |
| 15µm | - | - |
| standard form and size <small>(other forms and sizes are available by request)</small> | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 380 | 790 |

recommended crystalline quartz deposition monitors:
- with silver as electrode material

Evaporation Materials: Oxides

Our evaporation materials are available as granules with size from 1mm, pellets with diameter from 5mm, targets with size up to 1,000mm. They are suitable for both electron- and ion-beam evaporation as well as ion beam sputtering. The parameters in the table below are approximate and depend on the sinter and application conditions.

| material | Al ₂ O ₃ aluminium oxide | CeO ₂ cerium oxide | HfO ₂ hafnium oxide | In ₂ O ₃ indium oxide | In ₂ O ₃ -CeO ₂ indium-cer oxide |
|-----------------------------------|--|--|--|---|---|
| density colour transmission | 3.9g/cm ³ white 190nm...7µm | 7.3g/cm ³ yellow 400nm...12.5µm | 9.7g/cm ³ white 190nm...7µm | 7.2g/cm ³ yellow 400nm...7µm | 7.0g/cm ³ yellow 300nm...12.5µm |

refractive index and transmission

| wavelength | Al ₂ O ₃ | CeO ₂ | HfO ₂ | In ₂ O ₃ | In ₂ O ₃ -CeO ₂ |
|--|---------------------------------|---------------------------------|-----------------------------------|---------------------------------|--|
| 140nm | - | - | - | - | - |
| 150nm | - | - | - | - | - |
| 190nm | 1.92 | - | 2.48 | - | - |
| 300nm | 1.81 | - | 2.20 | - | - |
| 400nm | 1.79 | 2.23 | 2.16 | 2.06 | 2.06 |
| 600nm | 1.77 | 2.20 | 2.11 | 1.89 | 1.89 |
| 800nm | 1.76 | 2.18 | 2.09 | 1.77 | 1.77 |
| 1µm | 1.76 | 2.18 | 2.08 | 1.64 | 1.64 |
| 2µm | 1.74 | 2.17 | 2.06 | - | - |
| 4µm | 1.68 | 2.15 | 2.02 | - | - |
| 7µm | 1.47 | 2.05 | 1.90 | - | - |
| 8µm | - | 2.01 | - | - | - |
| 10µm | - | 1.95 | - | - | - |
| 12.5µm | - | 1.90 | - | - | - |
| 15µm | - | - | - | - | - |
| standard form and size (other forms and sizes are available by request) | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 170 | 210 | 1,100 (pillets) 790 (granules) | 890 | 1,250 |

recommended crystalline quartz deposition monitors:

- with aluminium as electrode material (choice 1)
- with silver as electrode material (choice 2)

Evaporation Materials: Oxides

Our evaporation materials are available as granules with size from 1mm, pellets with diameter from 5mm, targets with size up to 1,000mm. They are suitable for both electron- and ion-beam evaporation as well as ion beam sputtering. The parameters in the table below are approximate and depend on the sinter and application conditions.

| material | In ₂ O ₃ -SnO ₂ indium-tin oxide | MgO magnesium oxide | Nb ₂ O ₅ niobium oxide | SiO silicon monoxide | Si ₂ O ₃ disilicon trioxide |
|-----------------------------------|---|--|--|---|---|
| density colour transmission | 7.1g/cm ³ yellow-green 400nm...1µm | 3.6g/cm ³ white 300nm...8µm | 4.5g/cm ³ white 400nm...7µm | 2.1g/cm ³ dark 800nm...8µm | 2.2g/cm ³ gray 300nm...7µm |

refractive index and transmission

| wavelength | | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 140nm | - | - | - | - | - |
| 150nm | - | - | - | - | - |
| 190nm | - | - | - | - | - |
| 300nm | - | 1.80 | - | - | 1.55 |
| 400nm | 2.06 | 1.76 | 2.54 | - | 1.53 |
| 600nm | 1.89 | 1.74 | 2.33 | - | 1.52 |
| 800nm | 1.77 | 1.73 | 2.28 | 1.93 | 1.51 |
| 1µm | 1.64 | 1.72 | 2.26 | 1.90 | 1.51 |
| 2µm | - | 1.70 | 2.24 | 1.86 | 1.50 |
| 4µm | - | 1.67 | 2.20 | 1.80 | 1.45 |
| 7µm | - | 1.64 | 2.10 | 1.60 | 1.40 |
| 8µm | - | 1.61 | - | 1.16 | - |
| 10µm | - | - | - | - | - |
| 12.5µm | - | - | - | - | - |
| 15µm | - | - | - | - | - |
| standard form and size (other forms and sizes are available by request) | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 950 | 302 | 250 | 96 | 150 |

recommended crystalline quartz deposition monitors:

- with aluminium as electrode material (choice 1)
- with silver as electrode material (choice 2)

Evaporation Materials: Oxides

Our evaporation materials are available as granules with size from 1mm, pellets with diameter from 5mm, targets with size up to 1,000mm. They are suitable for both electron- and ion-beam evaporation as well as ion beam sputtering. The parameters in the table below are approximate and depend on the sinter and application conditions.

| material | SiO ₂ silicon dioxide | Sb ₂ O ₃ antimony trioxide | TaO ₂ tantalum dioxide | Ta ₂ O ₅ tantalum pentoxide |
|-----------------------------------|--|--|--|---|
| density colour transmission | 2.3g/cm ³ white 190nm...2µm | 5.2g/cm ³ white 400nm...12.5µm | 8.2g/cm ³ dark gray 300nm...7µm | 8.2g/cm ³ white 300nm...7µm |

refractive index and transmission

| wavelength | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 140nm | - | - | - | - |
| 150nm | - | - | - | - |
| 190nm | 1.56 | - | - | - |
| 300nm | 1.49 | - | 2.34 | 2.34 |
| 400nm | 1.47 | 2.15 | 2.25 | 2.25 |
| 600nm | 1.46 | 2.09 | 2.14 | 2.14 |
| 800nm | 1.45 | 2.06 | 2.10 | 2.10 |
| 1µm | 1.45 | 2.04 | 2.08 | 2.08 |
| 2µm | 1.44 | 2.00 | 2.04 | 2.04 |
| 4µm | - | 1.95 | 1.99 | 1.99 |
| 7µm | - | 1.89 | 1.77 | 1.77 |
| 8µm | - | 1.80 | - | - |
| 10µm | - | 1.69 | - | - |
| 12.5µm | - | 1.55 | - | - |
| 15µm | - | - | - | - |
| standard form and size (other forms and sizes are available by request) | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 80 | by request | 830 | 750 |

recommended crystalline quartz deposition monitors:

- with aluminium as electrode material (choice 1)
- with silver as electrode material (choice 2)

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| material | TiO titanium monoxide | Ti ₂ O ₃ ditanium trioxide | Ti ₃ O ₅ tritanium pentoxide | TiO ₂ titanium dioxide | Y ₂ O ₃ yttrium oxide |
|-----------------------------------|--|--|--|---|---|
| density colour transmission | 4.9g/cm ³ gold 400nm...10µm | 4.6g/cm ³ violet 400nm...10µm | 4.6g/cm ³ dark violet 400nm...10µm | 4.2g/cm ³ white 400nm...10µm | 5.0g/cm ³ white 300nm...8µm |

refractive index and transmission

| wavelength | | | | | |
|--|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|
| 140nm | - | - | - | - | - |
| 150nm | - | - | - | - | - |
| 190nm | - | - | - | - | - |
| 300nm | - | - | - | - | 2.07 |
| 400nm | 2,68 | 2.68 | 2.68 | 2.68 | 1.98 |
| 600nm | 2,60 | 2.60 | 2.60 | 2.60 | 1.93 |
| 800nm | 2,52 | 2.52 | 2.52 | 2.52 | 1.91 |
| 1µm | 2,49 | 2.49 | 2.49 | 2.49 | 1.90 |
| 2µm | 2,41 | 2.41 | 2.41 | 2.41 | 1.89 |
| 4µm | 2,31 | 2.31 | 2.31 | 2.31 | 1.86 |
| 7µm | 2,02 | 2.02 | 2.02 | 2.02 | 1.78 |
| 8µm | 1,87 | 1.87 | 1.87 | 1.87 | 1.74 |
| 10µm | 1,39 | 1.39 | 1.39 | 1.39 | - |
| 12.5µm | - | - | - | - | - |
| 15µm | - | - | - | - | - |
| standard form and size <small>(other forms and sizes are available by request)</small> | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 190 | 170 | 170 | 120 | 300 |

recommended crystalline quartz deposition monitors:

- with aluminium as electrode material (choice 1)
- with silver as electrode material (choice 2)

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| material | Yb ₂ O ₃ ytterbium oxide | ZrO zirconium monoxide | ZrO ₂ zirconium oxide |
|-----------------------------------|--|--|--|
| density colour transmission | 9.2g/cm ³ white 400nm...8µm | 6.4g/cm ³ dark gray 300nm...7µm | 5.6g/cm ³ white 300nm...7µm |

refractive index and transmission

| wavelength | | | |
|--|---------------------------------|---------------------------------|---------------------------------|
| 140nm | - | - | - |
| 150nm | - | - | - |
| 190nm | - | - | - |
| 300nm | - | 2.25 | 2.25 |
| 400nm | 1.98 | 2.22 | 2.22 |
| 600nm | 1.95 | 2.16 | 2.16 |
| 800nm | 1.92 | 2.14 | 2.14 |
| 1µm | 1.90 | 2.12 | 2.12 |
| 2µm | 1.88 | 2.10 | 2.10 |
| 4µm | 1.86 | 2.05 | 2.05 |
| 7µm | 1.78 | 1.96 | 1.96 |
| 8µm | 1.74 | - | - |
| 10µm | - | - | - |
| 12.5µm | - | - | - |
| 15µm | - | - | - |
| standard form and size (other forms and sizes are available by request) | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm | dia 18 x 10mm granules 1-6mm |
| price EUR/kg | 320 | 290 | 120 |